CONFERENCE OPINION
ON THE
EFFECTS OF THE FISH AND WILDLIFE SERVICE'S
ISSUANCE OF AN ENDANGERED SPECIES ACT SECTION 10(a)(1)(A)
ENHANCEMENT OF SURVIVAL PERMIT
TO
THE MAINE DEPARTMENT OF INLAND FISHERIES AND WILDLIFE
WITH A
CANDIDATE CONSERVATION AGREEMENT WITH ASSURANCES
FOR THE
NEW ENGLAND COTTONTAIL

MARCH 2015

U.S. FISH AND WILDLIFE SERVICE
NEW ENGLAND FIELD OFFICE
CONCORD, NH

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1. BACKGROUND

1.1 Introduction

This document provides a formal conference on the Fish and Wildlife Service's (Service) issuance of an Endangered Species Act (ESA) section 10(a)(1)(A) Enhancement of Survival Permit for the New England cottontail (*Sylvilagus transitionalis*) (NEC) to the Maine Department of Inland Fisheries and Wildlife (MDIFW). This Conference Opinion (Opinion) is based on information contained in the November 10, 2014 Programmatic Candidate Conservation Agreement with Assurances (CCAA) for the New England cottontail in Southern Maine between the MDIFW and the U.S. Fish and Wildlife Service, the December 3, 2014 National Environmental Policy Act Environmental Action Statement (NEPA document), and other sources of information referenced below. A complete administrative record of this Opinion is on file in the Service's New England Field Office, Concord, New Hampshire.

1.2 Informal Consultation on Federally Listed or Proposed Species

During the development of the NEPA document, the Service analyzed the effects of the proposed action on federally listed, proposed, or candidate species in the action area. During this review, the Service concluded that no adverse effects to federally listed or proposed species were expected because the MDIFW (1) would review the Natural Heritage Database for rare, threatened, and special concern wildlife species or the Service endangered species distribution lists to determine if federally listed or proposed species are located in or around each specific project site; or (2) had implemented measures to avoid adverse effects to the northern long-eared bat (NLEB) (see discussion below). If the review indicates that such a species may be present, the MDIFW would consult with the Service's Endangered Species Program to ensure that the activities are not likely to adversely affect that species or critical habitat.

The information provided below describes the habitat characteristics of federally listed, proposed, or candidate species and critical habitat in the area where the CCAA is to be implemented and compares its habitat to those that will be targeted for NEC habitat management to derive an effects determination for those species. The species include:

a) Small whorled pogonia (*Isotria medeoloides*)

This orchid occurs both in fairly young forests and in maturing stands of mixed-deciduous or mixed-deciduous/coniferous forests. In southern Maine, the small whorled pogonia (pogonia) has been documented in 18 towns throughout Cumberland, Kennebec, Oxford, and York Counties. This orchid occurs in stands of midsuccessional mixed forests. Characteristics common to sites where the pogonia is found include forested habitats having "older" canopy

trees estimated to be about 75 years of age. The majority of sites exhibit a sparse-to-moderate ground cover (except when among ferns), a relatively open understory, and proximity to long persisting breaks in the forest canopy, such as logging roads and streams. The highly-acidic, nutrient-poor soil in which this orchid grows is usually covered with leaf litter. The substrate tends to be variable in texture and ranges from extremely stony glacial till, to stone-free sandy loams, to sterile duff.

As provided in the site selection criteria identified in the CCAA, habitats that the pogonia favors are generally not conducive to the establishment of dense shrublands that are the primary target for activities covered under the CCAA. Sites favored by the pogonia are unlikely to provide sufficient vegetative response that would provide suitable habitat for the NEC. The forest canopy structure associated with pogonia sites will not generate the necessary thicket habitat that the NEC needs because the tree species in those locations do not tend to generate a sprout response that will reach the 20,000 stems per acre density threshold. In addition, the nutrient deficient soils that characterize pogonia sites are unlikely to support a shrub community of sufficient density to support the NEC.

Based upon the site selection criteria and environmental screening procedures for each project, we conclude that the CCAA is not likely to adversely affect the small whorled pogonia or its habitat.

c) Prairie white-fringed orchid (*Platanthera leucophaea*)

This rare orchid is only known to occur in a calcareous fen within a single bog in Maine's Aroostook County. As provided in the site selection criteria of the CCAA, no activities under the CCAA will occur within Aroostook County. Therefore, we conclude that the CCAA will have no effect on the Prairie white-fringed orchid or its habitat.

d) Furbish lousewort (*Pedicularis furbishiae*)

The Furbish lousewort is endemic to the riverine habitats located along the St. John River in 12 towns located in Aroostook County. As provided in the site selection criteria of the CCAA, no activities under the CCAA will occur in Aroostook County. Therefore, we conclude that this CCAA will have no effect on the Furbish lousewort or its habitat.

e) Canada lynx (*Lynx canadensis*)

The Canada lynx is known to occur throughout northern Maine in Aroostook, Franklin, Oxford, Penobscot, Piscataquis, Somerset, and Washington Counties. Landscapes capable of supporting

Canada lynx are characterized by having deep persistent snow through the winter in habitat comprised of boreal habitats that support abundant populations of snowshoe hare, which comprise the majority of its prey. These boreal habitats with persistent snows and high snowshoe hare occupancy provide no opportunity for creating NEC habitat. Maine contains designated critical habitat for the Canada lynx, but it is located in areas that are not targeted for management by the CCAA. As provided in the site selection criteria of the CCAA, no activities under the CCAA will occur within sites that are occupied by lynx.

Based upon the site selection criteria and environmental screening procedures for each project, we conclude that the CCAA will have no effect on the Canada lynx or its habitat.

f) Atlantic salmon (*Salmo salar*)

Historically, Atlantic salmon were found in all major river systems containing suitable spawning habitat throughout Maine. Currently within Maine, its range is limited to the Saco, lower Kennebec, lower Androscoggin, Sheepscot, Penobscot, Cove Brook, Passagassawakeag, Ducktrap, Narraguagus, Pleasant, Machias, East Machias, Dennys, and St. Croix Rivers. Critical habitat for the Atlantic salmon has been designated within areas covered by the CCAA in Androscoggin, Kennebec, Waldo, Knox, Lincoln and Sagadahoc Counties. The enrolled lands provide a minimal portion of the total habitat within the range of the Atlantic salmon. As provided in the site selection criteria of the CCAA, activities associated with the creation and maintenance of NEC habitat will not occur in Atlantic salmon habitat. Furthermore, activities covered under the CCAA will comply with timber harvesting and shoreland zoning laws, and follow the best management practices identified in section II.B of the Environmental Action Statement Screening Form, entitled *New England Cottontail Enhancement of Survival Permit and Candidate Conservation Agreement with Assurances between the U.S. Fish and Wildlife Service and the Maine Department of Inland Fisheries and Wildlife",* dated March 25, 2015. In addition, the habitat management prescriptions identified in individual Cooperative Agreements will consider effects to listed species as identified above.

Based upon the site selection criteria and environmental screening procedures for each project, we conclude that the CCAA will have no effect on the Atlantic salmon or its critical habitat.

g) Shortnose sturgeon (*Acipenser brevirostrum*)

These primitive fish inhabit large coastal rivers, migrating between fresh and estuarine waters. Spawning occurs in freshwater areas above the head of tide, while both freshwater and haline habitats are used for feeding and overwintering. Sturgeon populations in Maine have been documented in the Sheepscot, Kennebec, Androscoggin, and Penobscot Rivers, and Merrymeeting Bay. As provided in the site selection criteria of the CCAA, activities associated

with the creation and maintenance of NEC habitat will not occur in shortnose sturgeon habitat. Furthermore, activities covered under the CCAA will comply with timber harvesting and shoreland zoning laws, and follow the best management practices identified in the aforementioned Environmental Action Statement Screening Form. In addition, the habitat management prescriptions identified in individual Cooperative Agreements will consider effects to listed species as identified above.

Based upon the site selection criteria and environmental screening procedures for each project, we conclude that the CCAA will have no effect on the shortnose sturgeon or its habitat.

h) Northern long-eared bat (*Myotis septentrionalis*)

The NLEB is known to occur in southern Maine. White-nose syndrome (WNS) has caused a precipitous population decline in this species throughout the Northeast. In Maine, it is estimated that the NLEB population has declined by 99 percent because of WNS (MDIFW, state listing documentation). Currently, the species is proposed for listing under the Federal ESA and is also being considered for listing under Maine's ESA.

During the summer, the NLEB forages in forested habitats by night, and by day they roost in trees, buildings and other suitable locations that provide ample warmth and security. These roosting habitats also provide maternity sites where multiple females congregate to raise their young. In New Hampshire, prior to the outbreak of WNS in North America, trees used for maternity roosts by the NLEB averaged 10.8 individuals per tree (Sasse 1995, p. 34). Females with young may switch roost trees every two days and use two to seven different trees while they are nursing to obtain suitable temperatures and rearing conditions (Foster and Kurta 1999, p. 665). In the Northeast, maternity roosts are more likely to be in deciduous than coniferous trees (Broders and Forbes 2004, p. 605), and are often located in the largest available snags (dead standing trees) within any given stand (mean Diameter at Breast Height [DBH] 40.9 centimeters [cm] or 16.1 inches [in.] in Sasse 1995, pp. 23-25; mean DBH 41 cm [16 in.] in Garroway and Broders 2008, p. 91). NLEBs prefer roosting in trees that have sufficient structure, such as sloughing bark, crevices, and holes. If this structure is available they will use both live trees and snags, with a preference for snags in mid-decay (sloughing bark present; Lacki and Schwierjohann 2001, p. 482; Broders and Forbes 2004, p. 604; Sasse 1995, p. 23). Forest stands where maternity roosts are located generally contain tall, shade tolerant, deciduous trees; a significant number of snags; a relatively open tree canopy and contain a diversity of tree size classes (Sasse 1995, entire; Lacki and Schwierjohann 2001, entire; Broders and Forbes 2004, entire; Garroway and Broders 2008, entire). In late summer and early fall, NLEB migrate to areas with caves, mines, or other underground voids where they will hibernate through the winter season.

We considered whether tree clearing conducted under the CCAA will result in harm to the NLEB through significant habitat modification or degradation that result in death or injury to the species. In addition, we considered whether tree clearing would significantly impair key behavioral activities such as breeding, feeding, or sheltering. Forest inventory analysis estimates that the Programmatic CCAA Agreement Area contains approximately1.4 million ha (3.5 million ac) of forested habitat (McWilliams *et al.* 2005, p. 121). Based on current information regarding the implementation of forestry operations to enhance NEC habitat in Maine, we expect that each NEC habitat enhancement site will rarely exceed 50 acres in size. We also calculate that the total amount of forest that will potentially be managed for the benefit of NEC through the CCAA (4,856 ha or 12,000 ac) represents 0.3 percent of the forested habitat available for NLEB within the Agreement Area. Because the extent of forests impacted for NEC habitat enhancement sites is small compared with the amount of potential NLEB available in the area, and because the NLEB is known to be resilient to relatively large amounts of forest fragmentation (i.e., watershed scale disturbance) (Johnson *et al.* 2014, p. 229), we do not expect the CCAA to result in significant impacts to NLEB through reduction in foraging habitats. We also anticipate that the inadvertent loss of any potential roost trees resulting from activities associated with the CCAA will not excessively limit abundance or availability of roost trees for bats that have not succumbed to WNS. Consequently, we conclude that cutting of roost trees during the hibernation season is not likely to adversely affect NLEB, and no conservation measures to avoid harm will be required.

Next we considered whether tree clearing conducted under the CCAA will result in take of the NLEB through removal of roost trees during the summer roosting period. Due to their rarity and the extent of forest clearing conducted through the CCAA, there is minimal probability that tree clearing during the maternity season will adversely affect NLEB. In the rare instances when take does occur, we expect it to occur as a result of tree clearing during maternity periods when nonvolant NLEB young are most vulnerable to being killed or injured if the maternity roost is cut. To further minimize the potential effects of tree cutting on NLEB, landowner agreements under the CCAA will stipulate that forest cutting for NEC habitat restoration on enrolled lands should not occur between June 1 and August 15, which coincides with the period of the NLEB maternity season and when pups are expected to be present and vulnerable. A delay of forest cutting until after August 15 should allow adequate time for young NLEB to wean and become volant. This cutting restriction would not apply to trees less than 7.6 cm (3 in.) DBH. However, because a natural forest structure (e.g., the number of deciduous trees greater than 2m [6.5 feet] in height [Garroway and Broders 2008, p. 91]) is considered important to NLEB site selection in Acadian forests, understory trees less than 7.6 cm (3 in.) DBH in a mixed age forest will not be cut during the maternity period for NLEB. This cutting restriction only applies to lands enrolled under the CCAA for which NEC habitat management activities will be applied and does not apply to adjacent lands. Other forestry activities or tree cutting activities that the landowner may wish to conduct on adjacent lands do not require adherence to the June 1 to August 15 cutting restriction.

In summary, to reduce adverse effects to NLEB resulting from NEC habitat management activities, the following minimization measures will be adhered to:

- trees that are 7.6 cm (3 in.) DBH or greater will not be cut for the purpose of NEC habitat management during the maternity season defined for Maine, which extends from June 1 to August 15; and
- understory trees less than 7.6 cm (3 in.) DBH in a mixed age forest will not be cut from June 1 to August 15.

Based on incorporation of these measures, we conclude that the CCAA is not likely to adversely affect the NLEB, because effects are extremely low and unlikely to occur.

1.3 Conference History

December 5, 2013	The New England Field Office provides the draft CCAA document to the Regional Office for review and comment.
January 31, 2014	The Regional Office sends the draft CCAA to the solicitor for review.
March 10, 2014	The Regional Solicitor provides the Regional Office with a determination that the CCAA is legally sufficient.
April 1, 2014	The draft NEPA document was sent to the Regional Office.
April 18, 2014	The Regional Office sends the NEPA document and the Federal Register notice of availability documents for the CCAA to the Regional Solicitor for review.
July 1, 2014	Notice of availability announcing the availability of the Maine CCAA and NEPA document for public review and comment published in the Federal Register.
July 31, 2014	The public comment period closes. No comments were received.

2. CONFERENCE OPINION

2.1 Purpose and Format of this Opinion

Federal agencies, including the Service, must determine if projects they authorize, fund, or carry out will result in effects on listed and proposed species and designated or proposed critical habitat. Although including candidate species is not required by law, it is Service policy to also

consider effects to candidate species by treating them as if they are proposed for listing. Therefore, candidate species are considered during internal Service conferencing for actions involving National Wildlife Refuge operations, public use programs, private lands and federal aid activities, as well as promulgating regulations and issuing permits, to ensure that the action does not jeopardize the continued existence of candidate or proposed species or result in the destruction or adverse modification of proposed critical habitat.

Because this Opinion addresses a candidate species alone and no other endangered or threatened species are considered in the analysis, this document is considered a stand-alone Opinion. Therefore, the incidental take statement provided with this Opinion does not take effect until the species becomes listed. The Service may adopt this Opinion as the Biological Opinion for the action if the New England cottontail becomes listed and conditions have not resulted in a change to the jeopardy and incidental take analyses found herein.

2.2 Description of the Proposed Action

This section describes the proposed Federal action and the extent of the geographic area affected by the action (i.e., the action area). The term "action" is defined in the implementing regulations for section7 as:

"all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas." The term "action area" is defined in the regulations as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action."

The proposed action is the Service's issuance of an Enhancement of Survival Permit (permit) under section 10(a)(1)(A) of the ESA, to the MDIFW. The MDIFW has applied to the Service for a permit to authorize incidental take of NEC, should the species become listed under the ESA in the future. The permit would be issued in accordance with section 10(a)(1)(A) of the ESA, and the Service's Candidate Conservation Agreements with Assurances (CCAA) Final Rule (64 FR 32726). As part of their permit application, the MDIFW proposes to enter into the Agreement with the Service and is seeking the Service's approval of the Agreement and issuance of the permit. This permit would authorize limited incidental take of NEC on approximately 29,000 hectares (ha) (72,000 acres(ac)) of private and State-owned land located within York, Cumberland, Androscoggin, Sagadahoc, Lincoln, Knox, Oxford, Kennebec, and Waldo Counties in southern Maine (Figure 1).

By entering into the CCAA, the MDIFW would be authorized to extend permit coverage to private landowners through a "Certificate of Inclusion" upon finalization of a Cooperative Agreement that meets the CCAA standard. In this way, the MDIFW expects to enroll private and State-owned lands for the purpose of implementing habitat management practices that will benefit the NEC.

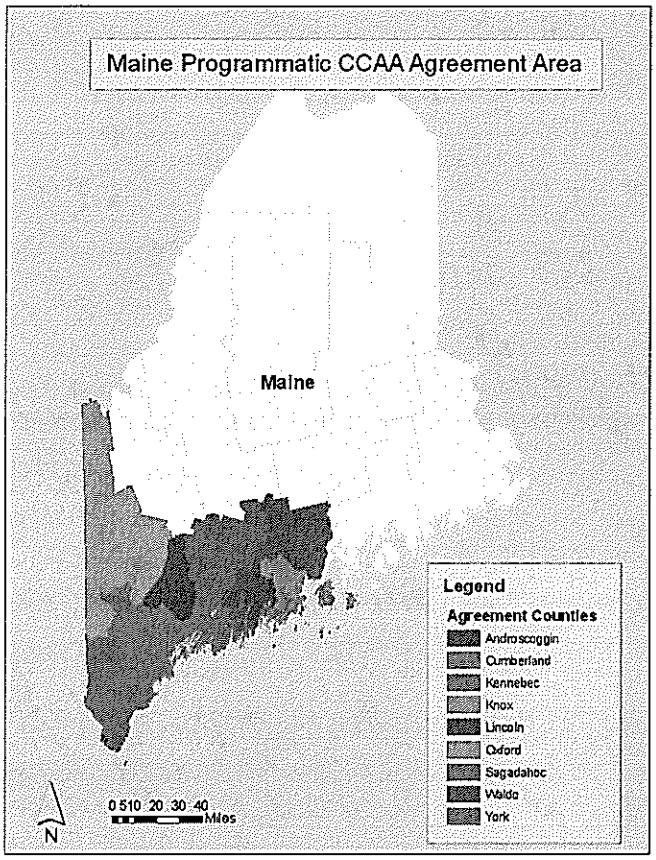

Figure 1. The Maine Programmatic Candidate Conservation Agreement with Assurances Priority Area covers the historical range of NEC in Maine, including York, Cumberland, Androscoggin, Sagadahoc, Lincoln, Knox, Oxford, Kennebec, and Waldo Counties.

As described in the Service's Final Policy for CCAAs (USFWS and NMFS 1999) (64 FR 32726), these agreements are intended to facilitate the conservation of proposed and candidate species and species that are likely to become candidates, by giving non-Federal property owners incentives to implement conservation measures. The incentive to a property owner provided through a CCAA is that the Service will impose no further land, water, or resource use restrictions beyond those agreed to in the CCAA should the species later become listed under the ESA. If the species does become listed, the property owner is authorized through an Enhancement of Survival Permit that is issued in association with the CCAA to take the covered species as long as the level of take is consistent with the level identified and agreed upon in the CCAA. To be deemed adequate, the Service must determine that the benefits of the conservation measures to be implemented, when combined with the benefits that would be achieved if it is assumed that conservation measures will also be implemented on other necessary properties, would preclude or remove any need to list the covered species.

Lands targeted for NEC habitat management are generally those for which the current land use maintains or is capable of maintaining suitable NEC habitat with minimal take of NECs. High value NEC conservation focus areas within the Maine CCAA Agreement Area were identified and ranked using information including, but not limited to, proximity to occupied NEC site(s),

potential habitat within parcel, current NEC habitat within parcel, and proximity to potential dispersal corridors (Figure 2). These areas will be the primary focus of the NEC conservation effort in Maine. However, focus area boundaries may change as information improves. For example, discovery of unknown populations within the Agreement Area may warrant an expansion of conservation efforts into new areas outside the current focus area boundaries.

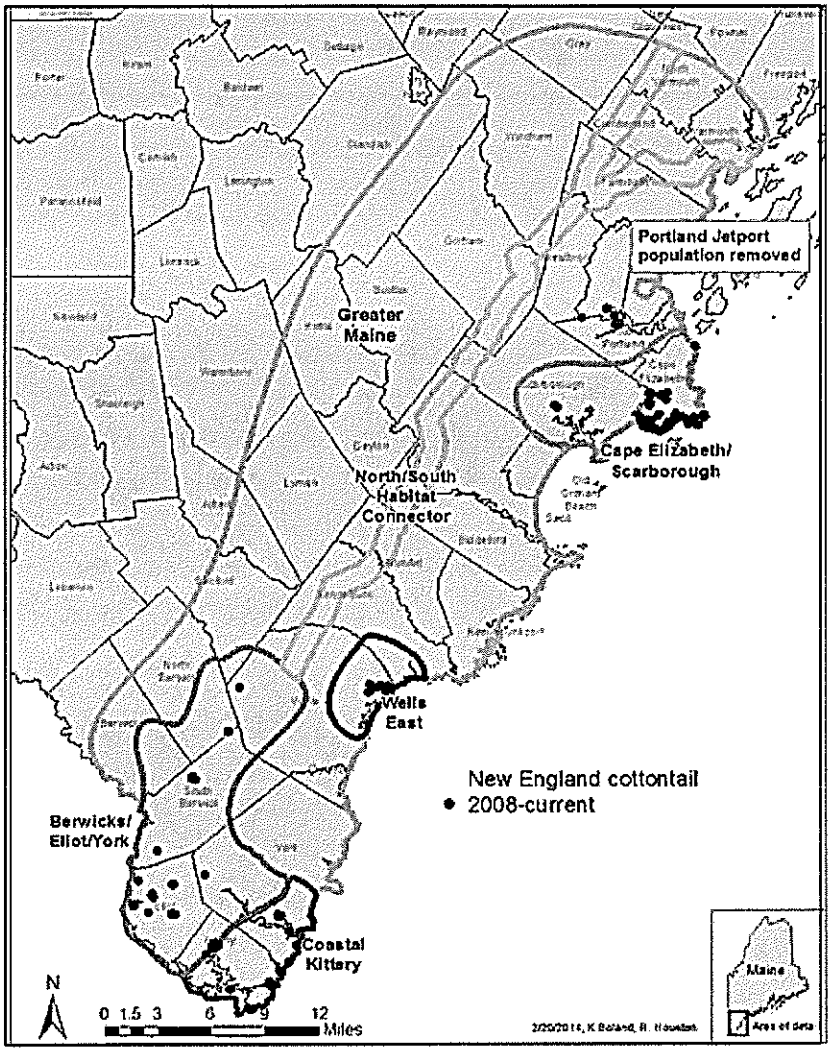

Figure_2. Maine's six focus areas and 2008 to 2013 New England cottontail locations.

Because resources for implementing conservation measures on enrolled lands are limited, sites with the highest potential value will be prioritized for enrollment. Also eligible for enrollment under the CCAA are those lands under the same ownership that are adjacent to lands being managed for the benefit of NEC (hereafter referred to as "adjacent lands"). These adjacent lands include areas where ongoing and future activities (e.g., hay production) may result in inadvertent take of NEC. Although the amount of adjacent acreage that a property owner will enroll under the CCAA will depend on the circumstances specific to the property and property owner, we estimate that the typical property owner will enroll an area of adjacent lands about equal to five times the area of the lands managed for NEC. Therefore, about 24,000 ha (60,000 ac) of adjacent lands are associated with the 4,856 ha (12,000 ac) targeted for NEC habitat management. If the total amount of habitat managed for NEC under the CCAA reached the target of 4,856 ha (12,000 ac), we estimate a total of about 29,000 ha (72,000 ac) would be enrolled under the CCAA.

2.3 Purpose of the Proposed Action

The purpose of the CCAA is for the Service to join with the MDIFW and those non-Federal property owners who choose to become Cooperators to implement conservation measures for the NEC. The conservation measures to be implemented pursuant to the CCAA are intended to maintain or improve habitat for this species by reducing or eliminating threats to the NEC over the next 50 years. Translocation of NEC to newly created, unoccupied habitat may also be undertaken to help recover the species. These actions, if similarly applied throughout the species' range, would be expected to remove the need to list this species under the ESA.

A programmatic approach is being employed to ensure consistent biological performance standards for all participating landowners, to gain efficiency in administering conservation with multiple landowners, and to best utilize the capabilities of the MDIFW for NEC conservation. The biological performance standards are stated in section 5 of the CCAA. The Parties to the CCAA have an interest in using existing programs and partnerships throughout the covered area to advance the purposes of the CCAA and to provide financial and technical assistance to interested landowners willing to conduct voluntary conservation measures for the NEC. Additionally, the CCAA will facilitate collaboration between the Parties and participating landowners by identifying expectations, establishing roles and responsibilities, and removing regulatory disincentives.

The implementation goal for the CCAA is to create several landscapes, each of which is expected to be capable of supporting a self-sustaining NEC population containing approximately 500 or more individual NEC. To achieve this goal, efforts will strive to provide a minimum of 404 ha (1,000 ac) of habitat that is occupied or located within dispersal distance (within one to three km or 0.6 to 1.9 mi.) of known occurrences. Conservation actions implemented through the CCAA will establish habitat connectivity and a management program that will sustain an infrastructure of early successional habitats capable of supporting a NEC population (Figure 3).

To achieve this goal, efforts within each Focus Area will strive to create a network of 15 or more habitat patches, several of which should be greater than 10 ha (25 ac). These large blocks of habitat should be located within one to three km (0.6 to 1.9 mi) of an adjacent suitable habitat patch, and there should be no barriers to dispersal between patches that would prevent individuals from traveling between nearby patches (e.g., a major highway or large river). Because most properties in southern Maine are small, it is unlikely that enough NEC habitat will be made available on any single property to reach the landscape habitat goal of at least 404 ha (1,000 ac). Instead, it is anticipated that the establishment of a NEC landscape will require participation by multiple properties in the conservation effort to achieve the desired amount of habitat needed to support a population. Therefore, these goals are provided to describe the

conservation approach and do not imply criteria to determine eligibility of a property for CCAA inclusion.

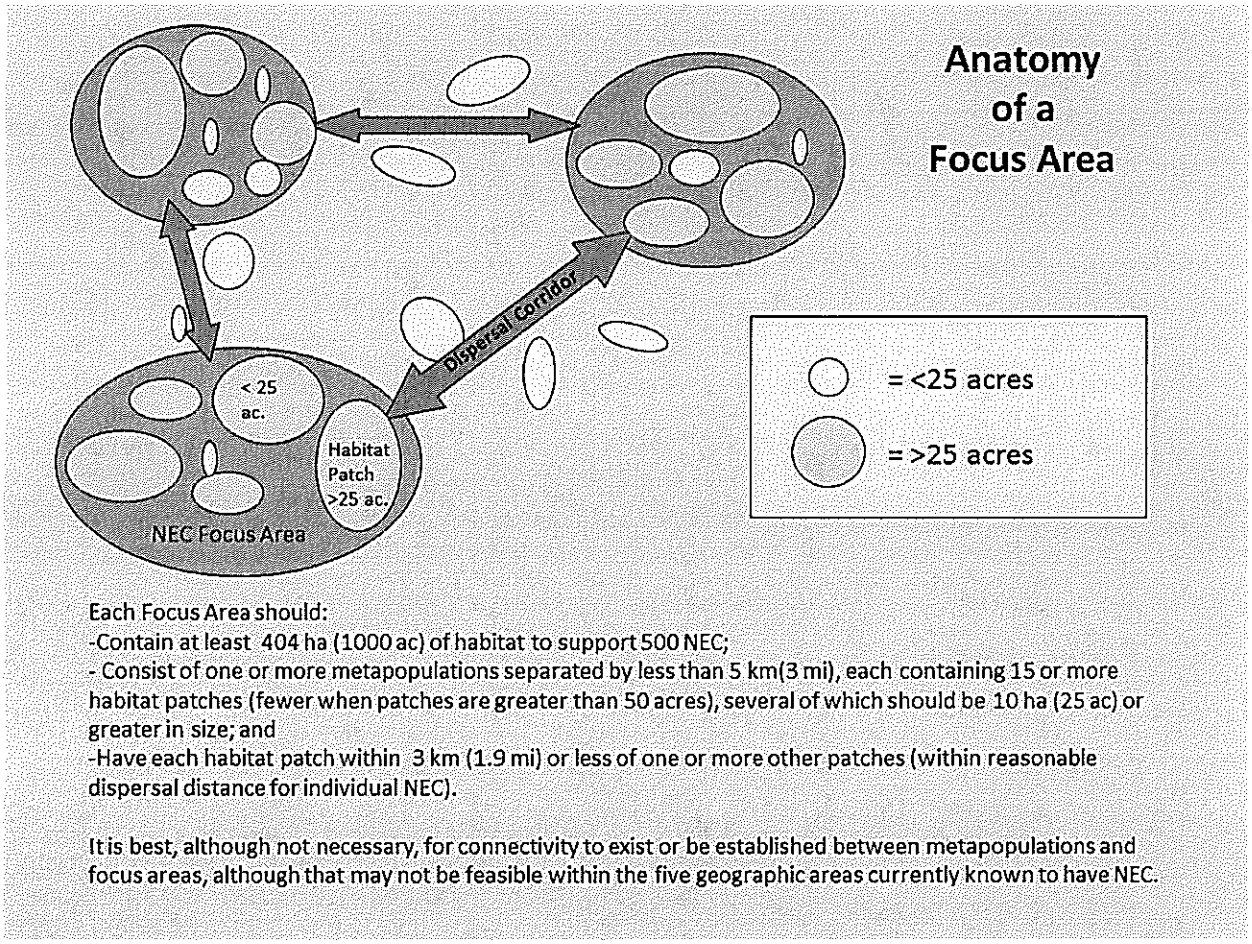

Figure 3. Conceptual Model for the Conservation of the New England Cottontail. This diagram depicts one possible configuration of habitat networks or metapopulations.

At a local scale, NEC populations are believed to function as a metapopulation (Litvaitis and Villafuerte 1996, p. 686). Persistence of these populations is governed by the quality, quantity, and connectivity of the habitat patches they occupy. While there have been no investigations into the specific metapopulation dynamics of the NEC, range-wide NEC conservation goals based upon the conservation principles of metapopulation conservation have been developed (Fuller and Tur 2012). At present, the Service believes that the following conservation goals would need to be achieved throughout the species' range to ensure the persistence of the NEC:

- avoid further loss and fragmentation of existing populations;
- implement conservation actions that increase patch quality, quantity, and connectivity;
- establish management agreements to ensure that large, source populations remain viable and their habitats remain suitable;

- implement conservation actions, throughout the range, to establish:
    - 1 NEC landscape capable of supporting 2,500 or more individuals;
    - 5 landscapes each capable of supporting 1,000 or more individuals; and
    - 12 landscapes each capable of supporting 500 or more individuals;
- evaluate the role of eastern cottontails as a non-native competitor and implement conservation actions that address this threat, as appropriate.

The CCAA establishes a framework that will make possible the initiation of a program to implement the above measures within the State of Maine. It is recognized that the CCAA alone will not be able to meet all the necessary rangewide conservation goals identified above. The CCAA contributes to the achievement of the broader NEC conservation goals because it seeks to create several landscapes, each capable of supporting a viable population of cottontails containing a minimum of 500 acres of habitat, thereby meeting the CCAA standard. Additional actions in other portions of the species' range must be implemented to preclude the need to list the NEC.

Table 1 in the CCAA identifies the potential threats the NEC faces, the processes by which those threats are manifested, conservation measures that will address the threats, and the expected conservation benefit of the implemented conservation measure. During the development of each cooperative agreement, specific threats to the NEC on the enrolled property will be identified. In cooperation with the landowner, a plan will be developed that specifies the conservation measures necessary to address the threats on that enrolled property and to contribute to the NEC conservation goals.

Table 2 in the CCAA describes covered activities that may result in take within areas designated for NEC habitat management. The Table also presents the take minimization measures that will typically be implemented when NEC are present.

3. ANALYTICAL FRAMEWORK FOR THE JEOPARDY DETERMINATION

3.1 Jeopardy Determination

In accordance with policy and regulation, the jeopardy analysis in this Opinion relies on four components: (1) the *Status of the Species*, which evaluates the condition of NEC range-wide, the threats to the species and its survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the NEC in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the NEC; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the NEC; and (4) *Cumulative*

Effects, which evaluates the effects of future, non-Federal activities in the action area on the NEC.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the NEC's current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the NEC.

The jeopardy analysis in this Opinion places emphasis on consideration of the range-wide survival and recovery needs of the NEC and the role of the action area in the survival and recovery of the NEC as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

If the NEC is listed under the ESA, the Service may adopt this Opinion as the Biological Opinion for the action under section 7 of the ESA, provided none of the reinitiation criteria at 50 CFR 402.16 apply.

3.2 Adverse Modification Determination

No critical habitat for the NEC has been proposed or designated, thus this Opinion does not consider this matter.

4. ENVIRONMENTAL BASELINE

4.1 Species Description, Life History, Habitat Characteristics and Status

The only endemic cottontail in New England (Probert and Litvaitis 1996, p. 289), the NEC is a medium-large cottontail rabbit that may reach 1,000 grams (2.2 pounds) in weight. Like the conspecific eastern cottontail (*Sylvilagus floridanus*), the NEC can be distinguished from the snowshoe hare by its lack of seasonal variation in pelage coloration and distinctly smaller hind foot. New England and eastern cottontails can be difficult to distinguish in the field by external characteristics (Chapman and Ceballos 1990, p. 106). However, cranial differences, specifically the length of the supraorbital process and the pattern of the nasal frontal suture, are a reliable means of distinguishing the two cottontail species (Johnston 1972, pp. 6-11).

The NEC, like all cottontails, is short lived and reproduces at an early age with some juveniles probably breeding in their first season. Litter size is typically five young (range 3-8) and females, which provide little parental care, may have 2-3 litters per year. The breeding season lasts from mid-March to mid-September in Connecticut (Dalke 1942 in Chapman, Hockman and Edwards 1982, p. 93). Initiation of nesting is closely associated with the spring green-up

(Chapman, Hockman and Edwards 1982, p. 94). Several attempts have been made to document NEC nesting habitat, however locating nests has proven to be very difficult because nests are concealed in extremely dense vegetation, prohibiting researcher access and discovery (T. Goodie, pers. comm.). Female NECs have a high incidence of postpartum breeding, demonstrate density independent breeding response, and have a rapid rate of maturity (approximately 40 days from conception to parental freedom) (Chapman and Ceballos 1990, p. 108). These characteristics allow a species to thrive in spite of a high predation rate, provided ample resources are available (Chapman, Hockman and Edwards 1982, p. 105). In the case of cottontail rabbits, these principal resources include ample food and habitat that is free from interspecific competition and provides security from excessive predation (Chapman, Hockman and Edwards 1982, p. 106).

The historic range of the species likely spanned southeastern New York (east of the Hudson River, including Long Island) north through the Champlain Valley, southern Vermont, the southern half of New Hampshire, southern Maine, and statewide in Massachusetts, Connecticut and Rhode Island (Nelson 1909; Litvaitis and Litvaitis 1996, p. 725). The historical range encompassed an estimated 90,000 square kilometers (km^2) (34,750 square miles (mi^2) (Litvaitis *et al.* 2006, p. 1191).

NECs are considered habitat specialists, insofar as they are dependent upon early-successional habitats, frequently described as thickets (Litvaitis 2001, p. 466). Barbour and Litvaitis (1993, p. 324) demonstrated a relationship with microhabitats containing >50,000 stem-cover units/ha (20,234 stem cover units/acre). Historically, thicket-dependent species like the NEC may have persisted in core habitats associated with frost pockets, barrens, and the shrubby interface between wetlands and upland forests (Litvaitis 2003, p. 120). Soil conditions, fire or other disturbances limited forest canopy closure in many shrublands (Lorimer and White 2003, p. 41; Latham 2003, p. 34; Brooks 2003, p. 65). From these more persistent core habitats, thicket-dependent species such as the NEC could have dispersed opportunistically to occupy smaller, disturbance-generated patches of suitable habitat (Litvaitis 2003, p. 120). Stable coastal shrub communities are often overlooked for their importance to thicket-dependent wildlife, yet these habitats may have provided a substantial amount of this habitat type.

Although the amount of shrubland and early successional habitat in the pre-Columbian landscape of the Northeast is not well known, it is generally accepted that these habitats were probably never naturally abundant prior to European settlement (Brooks 2003, p. 65). Fires set by Native Americans set back forest succession and maintained areas of suitable habitat (Bromley 1935, p. 64; Cronon 1983, p. 49). In addition, periodic wildfires and coastal storms such as hurricanes, resulted in an estimated 10 to 31 percent of coastal, pine-oak forests in the seedling-sapling stage (age 1-15 years), a condition providing favorable habitat for the cottontail (Lorimer and White 2003, pp. 45 and 46). In inland forests, where fires were less frequent, beaver activity and

cyclical insect outbreaks set back forest succession. Of the inland forests, about 6 percent of the landscape is estimated to have been in an early successional stage capable of providing suitable habitat for the NEC (Litvaitis 2003, p. 117). Another model for inland forests suggests that stand regenerating disturbances were very rare and most early successional forest patches were the result of tree-falls (gap phase replacement) in an otherwise broadly distributed climax forest (Lorimer 1977 in Brooks 2003, p. 70).

The distribution of the NEC has declined substantially and occurrences have become increasingly disjunct. Overall, in comparison to the 90,000 km^2 (34,750 mi^2) encompassed in the estimated distribution for the species in 1960, the current estimated range covers 12,180 km^2 (4,700 mi^2) (Litvaitis *et al.* 2006, p. 1192).

The presence of otherwise suitable habitat, that is, habitat containing appropriate vegetation structure, does not necessarily mean that it is suitable for sustained occupancy by the NEC. Instead, occupancy of individual habitat patches is dictated by patch-specific parameters relating to habitat quantity and quality, as well as the spatial distribution of patches at a landscape scale. This was illustrated by a multi-state, regional inventory to determine the distribution of NECs (Litvaitis *et al.* 2006, pp. 1190-1197). Litvaitis *et al.* (2006, p. 1193) reported that NEC were absent from 93 percent of 2,333 habitat patches within the recent historical range (1990 to present) that were searched for the presence of the species. Many of the unoccupied patches were considered of inadequate size or lower habitat quality due to succession or were occupied by eastern cottontails (J. Litvaitis, pers. comm.).

In 2013, the Service completed a Status Assessment and Listing Priority Assignment for the NEC (available at http://ecos.fws.gov/docs/candidate/assessments/2013/r5/A09B_V01.pdf, accessed March 2015). The Status Assessment assesses the threats to the species in terms of the ESA's five listing factors:

> (A) the present or threatened destruction, modification, or curtailment of its habitat or range;
> (B) overutilization for commercial, recreational, scientific, or educational purposes;
> (C) disease or predation;
> (D) the inadequacy of existing regulatory mechanisms; and
> (E) other natural or manmade factors affecting its continued existence.

Populations of the NEC are still present in most states in the historical range, but the species' habitat and range have undergone significant decline. Although we do not have numerical population trend data (and it would be extremely difficult to obtain), it is reasonable to conclude that the significant reduction in the range and habitat of the species has been accompanied by a concurrent numerical population decline.

The decline in range is most severe in Vermont, where the species is believed to be extirpated. In general, the range of the NEC has contracted by 80 percent or more since 1960 (Litvaitis *et al.* 2006, p. 1191). Current land uses in the region indicate that the rate of change, about two percent range loss per year, will continue (Litvaitis and Johnson 2002, pp. 3-4). In a recent survey, the species was found at only about 153 of 2,333 (7 percent) habitat patches (thickets) within areas occupied since 1960 (Litvaitis *et al.* 2006). Furthermore, the current distribution of NEC has been fragmented into five population clusters that may be functioning as metapopulations (Figure 4, Litvaitis and Villafuerte 1996, pg. 687). In a recent landscape genetics study, researchers found evidence that populations of NEC in Maine are fragmented (Fenderson 2014). Forest inventory data document the decline of suitable habitat and curtailment and fragmentation of NEC range.

Without conservation actions, habitat for the cottontail is likely to be slowly degraded and eliminated as a result of natural succession processes that lead to forest maturation. This loss of habitat through forest succession is not being balanced by natural processes (e.g., wildfire) that once established early successional habitat. Habitat loss is further accelerated by destruction and modification of habitat associated with a variety of human uses of the landscape. The present and threatened destruction, modification, and curtailment of NEC habitat and range are a threat to the persistence of the species.

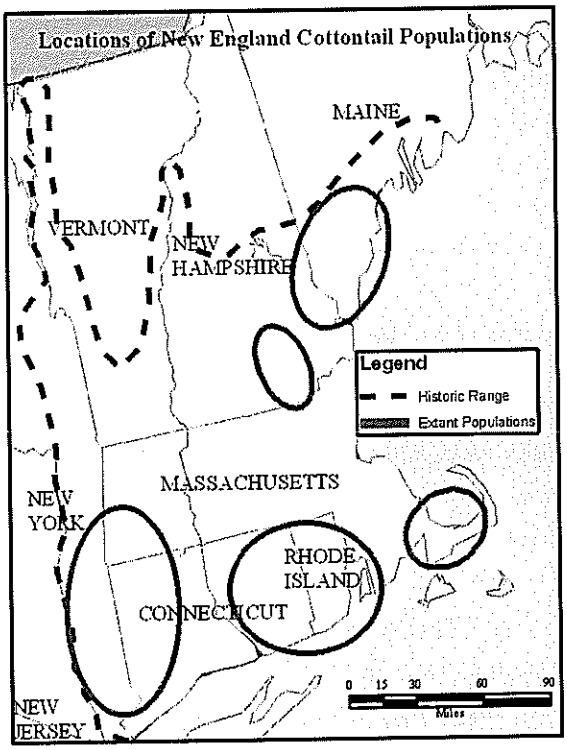

Figure 4. Distribution of Five Extant New England Cottontail Populations within the Species' Historical Range (adapted from Nelson 1909; Litvaitis and Litvaitis 1996, p. 725).

Although predation is not normally a threat to most species and there is no reason to believe it is a threat to the NEC under natural conditions, the alteration of habitat has resulted in conditions that heighten the vulnerability of the NEC to predators. Cottontails dispersing from relatively large patches of habitat may occupy smaller patches where they are more vulnerable to predation (Barbour and Litvaitis 1993, pp. 325 and 326) and they may not survive long enough to reproduce and have young recruited into the population. The absence of NECs in so many patches of habitat is attributed to predation, particularly in small habitat patches, and to barriers to cottontail dispersal such as developed areas, roads, and other unsuitable habitats. This

situation is compounded by increased populations of generalist predators. Consequently, predation, as exacerbated by habitat fragmentation and the small size of many of the remaining suitable patches of habitat, poses a threat to the species. During our status review, we found no evidence that disease was a threat to the NEC (http://www.fws.gov/ecos/ajax/species Profile/profile/speciesProfile.action?spcode=A09B) (accessed March 2015).

Most remaining habitat is on private land that is not being managed for habitat conditions needed by the NEC and is not now subject to regulatory mechanisms that would require such management. Within the five population clusters, the Service estimated that less than one-third of the NEC populations occur on state, Federal, or private conservation land, and only a fraction of that habitat, perhaps 10 percent, is being managed for habitat conditions needed by the species. Existing regulatory mechanisms are not sufficient to address the continued destruction and modification of habitat through habitat conversion and fragmentation associated with expanding human populations. The Service concluded that existing regulatory mechanisms are inadequate to protect the species, particularly with regard to destruction and modification of the habitat and range of the NEC.

Other natural or manmade factors are also a threat to the continued existence of the species. Specifically, within its historical range, the NEC is being replaced by introduced eastern cottontails, which are now five times more likely to be encountered within the Northeast than the native NEC. Having more generalized requirements that allow it to exist in a wider array of habitats, and being less vulnerable to predation, the eastern cottontail can outcompete and displace the NEC where their ranges overlap. Also, a potential effect from burgeoning white-tailed deer (*Odocoileus virginianus*) populations is competition for food, and an indirect adverse effect is the reduction in cover due to overbrowsing by deer, which may contribute to increased vulnerability of cottontails to predators.

Based on the status of the species, the Service concluded that listing the NEC was warranted, but precluded by other listing actions, and designated the NEC a "Candidate" for listing (71 F.R. 53756, 53757-58 [Sept. 12, 2006]).This conclusion was most recently reaffirmed through an annual status assessment that was announced in 2013 (77 FR 70162 [Nov. 22, 2013]). As a candidate species, the NEC is eligible for inclusion in CCAAs.

4.2 Status of the Species in Maine

The current distribution of the NEC extends from the Town of Cape Elizabeth, south to the Town of Kittery and extending inland approximately 16 km (10 miles) to the Town of Eliot. Within the broader geographic area, recent survey efforts and genetic analysis indicate that the population in Maine is fragmented into: (1) a large cluster of individuals occurring in the Cape Elizabeth region; (2) a small number of individuals associated with the Town of Kittery; (3) a

small number of individuals located in the Town of Wells; and (4) a scattered population located in southern Maine west of Interstate 95 (Fenderson *et al.* 2014, entire). In the early 2000s, the mid-winter NEC population in Maine was estimated to be 316 individuals (Litvaitis and Jakubas 2004, p. 37). The distribution of the species appears to have contracted since then, so it is reasonable to assume that the population has also declined.

5. EFFECTS OF THE PROPOSED ACTION

This section considers the direct and indirect effects of the proposed permit on the NEC, together with the effects of other activities that are interrelated or interdependent with the action.

5.1 Direct and Indirect Effects

5.1.1 Agreement Effects: Threat Reduction

As mentioned earlier (see Purpose of the Proposed Action), the purpose of the CCAA is for the Service to join with the MDIFW and those non-Federal property owners who choose to become Cooperators to implement conservation measures for the NEC. The conservation measures to be implemented pursuant to the CCAA are intended to maintain or improve habitat for this species by reducing or eliminating threats to the NEC in Maine over the next 50 years. Table 1 in the CCAA identifies the potential threats the NEC faces, the processes by which those threats are manifested, conservation measures that will address the threats, and the expected conservation benefit of the implemented conservation measure.

The CCAA establishes a framework that will make possible the initiation of a program to implement the above measures within the State of Maine. It is recognized that the CCAA alone will not be able to meet all the necessary rangewide conservation goals identified above. The CCAA contributes to the achievement of the broader NEC conservation goals because it seeks to create several landscapes, each capable of supporting a viable population of cottontails containing a minimum of 1,000 acres of habitat, thereby meeting the CCAA standard. Additional actions in other portions of the species' range must be implemented to preclude the need to list the NEC.

5.1.2 Site-Specific Effects

The CCAA sets out to reduce threats to the NEC in southern Maine through the development of Cooperative Agreements with landowners that will describe property-specific threats and conservation measures that are designed to address those threats. However, not all adverse effects on the enrolled properties are expected to be eliminated and implementation of conservation measures in areas occupied by the NEC may result in take. Because adverse effects

on enrolled properties are anticipated, the CCAA identified several activities that are reasonably likely to result in take (specifically death or injury) of NEC. The activities for which coverage is provided include:

- Implementation of conservation measures specifically for the benefit of the NEC such as tree removal, invasive species control, and hydrologic restoration.
- Activities that are carried out on areas of an enrolled property managed for the benefit of the NEC and that facilitate, or are compatible with, the creation, improvement, and maintenance of NEC suitable habitat. Potentially compatible activities include utility right-of-way maintenance, access way use and maintenance, hunting (except rabbit hunting), fishing, use of recreational vehicles, horseback riding, camping, and hiking.
- Certain activities that are carried out on areas of an enrolled property adjacent to areas managed for the benefit of the NEC and that are not beneficial to NEC. Activities on areas adjacent to occupied habitat that may be covered include, but are not limited to farming and silviculture. Minor construction activities associated with existing land uses (e.g., construction of a tractor shed) that are conducted on areas adjacent to lands managed for NEC and that cause no more than minimal impacts may be covered. Development activities causing more than minimal impacts to NEC are specifically omitted from coverage. These higher impact activities are not covered because it is unlikely that take could be offset to the degree necessary to meet the CCAA standard. Such activities are beyond the scope of analysis for the CCAA.

Activities within occupied suitable habitat are expected to expose NEC to the greatest amount of risk for take. For an activity to be covered under the CCAA, the property owner must provide sufficient detail in their Agreement regarding current land use practices, existing conditions, and expected land use changes. The information provided must adequately describe the nature of the activity such that the effects can be sufficiently analyzed, appropriate take minimization measures can be developed, and the level of take can be reasonably estimated. This information must be included in the Cooperative Agreement so that it can be reviewed by the MDIFW and the Service to determine compliance with the ESA, regulations, and CCAA Policy. Specifically, covered activities will be reviewed to determine if the conservation measures implemented adequately offset take resulting from the covered activities. Higher impact activities that are not adequately offset by the proposed conservation efforts are not covered because take is not offset to the degree necessary to meet the CCAA standard. Such activities are beyond the scope of analysis for the CCAA.

For an activity conducted within an area where suitable habitat is not present, the property owner must provide sufficient detail regarding current land use practices, existing conditions, and expected land use changes. The information provided must adequately describe the nature of the activity such that the effects can be sufficiently analyzed, appropriate take minimization

measures can be developed, the level of take can be reasonably estimated, and a finding of compliance with the ESA, regulations, and CCAA Policy can be made.

Table 2 in the CCAA describes covered activities that may result in take within areas designated for NEC habitat management. The table also presents the take minimization measures that will typically be implemented when NEC are present.

There are no published or unpublished studies examining whether NEC are likely to be killed or injured during routine land management activities. Accordingly, the Service is relying on information on the life history and habitat preferences for the species, personal observation of NEC, and familiarity with the land management activities that promote early successional habitat to assess the type and amount of take. The take minimization measures (Table 2 in the CCAA) described in section 6 of the CCAA are expected to preclude the take of NEC for most covered activities in most situations. However, across all enrolled acres and over the 50-year term of the CCAA, the Service believes that NECs are likely to be incidentally taken.

In the rare instances when take does occur, we expect it will be in the form of killing (e.g., accidental crushing by farm machinery or felling of trees), harassment (e.g., flushing of NEC into less secure habitat exposing them to increased risks of predation and exposure to the elements), and harm (e.g., habitat modification that reduces cover and exposes rabbits to increased risks of predation or exposure to the elements). With implementation of the take minimization measures (Table 2 in the CCAA) the covered activities in most situations are expected to result in only minor disturbance to NEC that does not cause death or injury and therefore does not constitute take under the ESA.

Dispersal behavior of NECs is poorly understood. During dispersal events, NECs may strike out through haylands, wood lots, or other areas that expose them to a risk of take from farming, silviculture operations, and other activities. Although covered activities that occur at these locations may result in take, this is expected to be a rare occurrence, because dispersing NEC are moving through these areas and not occupying them for long periods of time

In the development of Cooperative Agreements, the design of NEC conservation measures and the incorporation of take minimization measures for all covered activities will preclude several forms of take. For example, time-of-year restrictions for certain activities to avoid the nesting season will prevent the direct take of nestling NECs through immediate killing or injuring, or indirectly, through taking of the mother.

Because NEC must spend a considerable amount of time feeding and because predation pressure is high, a NEC that is injured by a covered activity will experience a great survival disadvantage. Although some NEC may recover from injury, we expect that, for almost all injured NEC, injury

will eventually lead to death. Therefore, for purposes of this take analysis, we assume a worst case scenario that all take will be in the form of death.

5.1.3 Species' Response to the Proposed Action

In summary, the direct and indirect effects to the NEC from implementation of the CCAA are expected to increase NEC habitat quality, quantity and connectivity in southern Maine. In the process, limited adverse effects in the form of death or injury to individual rabbits will likely occur due to implementation of the covered activities, including land use activities and implementation of conservation measures in areas occupied by the NEC.

In the section 8 of the CCAA, the MDIFW and the Service discussed the type and amount of take expected. This analysis led to an estimation of 240 NECs taken on an annual basis under full enrollment of 72,000 acres across the entire Agreement Area. However, the net effect of the CCAA will be to reduce the threats to the species, thereby increasing NEC populations. In addition, the take minimization measures described are intended to reduce the likelihood and amount of direct and indirect effects that occur on lands enrolled in the CCAA by increasing landowner awareness of the species' needs and by maintaining and increasing available habitat through implementation of the conservation measures described. These efforts, when combined with the CCAA's regulatory assurances, should encourage the development of cooperative relationships with participating landowners, resulting in an overall conservation benefit to the NEC. The anticipated result of the CCAA is the establishment of a sufficient amount of habitat that is expected to support approximately 7,900 individuals, resulting in the long-term enhancement of survival of the NEC in southern Maine.

5.2 Effects of Interrelated or Interdependent Actions

Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consultation.

No activities or other actions are known to be interrelated or interdependent to the proposed action.

5.3 Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require

separate consultation pursuant to section 7 of the ESA, if the species became listed as either endangered or threatened.

In general, land use activities, including agricultural activities and development, on non-Federal lands are expected to continue. Since these activities are expected to continue on lands not enrolled under the CCAA, most of the threats to the NEC would also continue. Lands that are not enrolled under the CCAA would likely remain similar or continue to degrade from their current habitat condition because the primary threats to the species, loss and fragmentation of habitat by successional processes and land-use conversion, are expected to continue. However, the CCAA is specifically structured to address these threats and should, therefore, minimize the effects of activities on non-enrolled lands.

5.4 Conclusion

After reviewing the current status of the NEC, the environmental baseline for the species, the effects of the proposed action and the cumulative effects, it is the Service's Opinion that the action, as proposed, is not likely to jeopardize the continued existence of the NEC. No critical habitat has been designated for the NEC; therefore, none will be affected.

Approval of the CCAA, including issuance of the section 10(a)(1)(A) permit, is likely to reduce multiple threats to the NEC in southern Maine. Specifically, the CCAA is intended to foster participation of non-Federal property owners in a program that seeks to provide direct conservation benefits to the NEC in southern Maine.

Although some incidental take will be authorized under the permit for the MDIFW, the conservation measures implemented under the CCAA are expected to appreciably increase the likelihood of both the survival and recovery of the NEC in the wild by increasing the species numbers and distribution within the action area. Currently, the NEC distribution in Maine is fragmented and represents only a small portion of its historic range with a current population estimate of 300 animals or less. The CCAA seeks to increase habitat quality, quantity and connectivity at a local scale, resulting in the establishment of a sufficient amount of habitat that is expected to support up to 7,900 individuals. The distribution of the species is also expected to increase throughout the action area.

6. INCIDENTAL TAKE STATEMENT

6.1 Incidental Take Statement

The Incidental Take Statement provided in this Opinion does not become effective until such time that the species is listed as either threatened or endangered, pursuant to the ESA, and the

Opinion is adopted as the Biological Opinion issued through formal consultation. At that time, the CCAA will be reviewed to determine whether any take of the NEC has occurred. Modifications of the Opinion and Incidental Take Statement may be appropriate to reflect that take. No take of the NEC may occur between the listing of the NEC and the adoption of the Opinion through formal consultation, or the completion of a subsequent formal consultation.

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. Harass is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA, provided that such taking is in compliance with the terms and conditions of an Incidental Take Statement.

The exemption from the section 9 take prohibitions for activities covered under the CCAA is provided to the MDIFW, and Parties with a valid Certificate of Inclusion, under authority of the ESA section 10(a)(1)(A) permit, as well as this Incidental Take Statement. Such an exemption for the Service is provided via this Incidental Take Statement.

All monitoring and compliance measures described in the CCAA, along with conservation measures identified in the Cooperative Agreements, together with the terms and conditions described in the section 10(a)(1)(A) permit issued with respect to the CCAA, are hereby incorporated by reference as reasonable and prudent measures and the terms and conditions within this Incidental Take Statement pursuant to 50 CFR 402.14(i). The Service has determined that no additional reasonable and prudent measures or terms and conditions are necessary and appropriate to further minimize the impacts of the anticipated take on the NEC. These terms and conditions are non-discretionary and must be undertaken for the exemptions under section 10(a)(1)(A) and section 7(o)(2) of the ESA to apply. If the MDIFW or Parties with a valid Certificate of Inclusion fail to adhere to these terms and conditions, the protective coverage of the section 10(a)(1)(A) permit and section 7 (o)(2) may lapse.

6.2 Amount or Extent of Take Anticipated

Incidental take in the form of harass, wound, or kill caused by covered activities is expected to involve up to 240 NECs taken on an annual basis under full enrollment of 72,000 acres across the entire Agreement Area. However, the conservation benefits resulting from maintenance of existing habitat, enhancement of marginal habitat, and creation of new habitat will far outweigh any short-term adverse effects to individual NECs caused by the covered activities described in section 5.1.2.

6.3 Effect of the Take

In this Opinion, the Service determined that the level of anticipated take is not likely to result in jeopardy to the NEC. Instead, the habitat protection provided under the CCAA on lands enrolled in the CCAA is expected to enhance the long-term survival of the NEC, even with some authorization of incidental take under the permit.

6.4 Reasonable and Prudent Measures and Terms and Conditions

All monitoring and compliance measures described in the CCAA, along with conservation measures identified in the Cooperative Agreements, together with the terms and conditions described in the section 10(a)(1)(A) permit issued with respect to the CCAA, are hereby incorporated by reference as reasonable and prudent measures and the terms and conditions within this Incidental Take Statement pursuant to 50 CFR 402.14(i). The Service has determined that no additional reasonable and prudent measures or terms and conditions are necessary and appropriate to further minimize the impacts of the anticipated take on the NEC.

6.5 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or proposed critical habitat, to help implement recovery plans, or to develop information.

No conservation recommendations are provided here because the CCAA has included conservation measures to promote the conservation of the NEC within the action area; additional recommendations are not necessary.

7. REINITIATION-CLOSING STATEMENT

This concludes formal consultation regarding the effects of the Service's proposed issuance of a section 10(a)(1)(A) permit to the MDIFW. Should the NEC be listed, this Opinion can be adopted as a Biological Opinion in response to an intra-Service formal request for such an adoption, provided no significant new information is developed and no significant changes to the Federal action considered herein are made that would alter the content of this Opinion at the time the NEC is listed.

Should the NEC be listed and this Opinion is adopted as a Biological Opinion as provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

8. SIGNATURE

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25 MAR 2015
Date

9. LITERATURE CITED

Barbour, M.S. and J.A. Litvaitis. 1993. Niche dimensions of New England cottontails in relation to habitat patch size. Oecologia 95:321-327.

Broders, H.G., and G.J. Forbes. 2004. Interspecific and intersexual variation in roost-site selection of northern long-eared and little brown bats in the Greater Fundy National Park ecosystem. Journal of Wildlife Management. 68:602-610.

Bromley, S. W. 1935. The original forest types of southern New England. Ecol. Monographs 5:23-32.

Brooks, R.T. 2003. Abundance, distribution, trends and ownership patterns of early-successional forests and native shrublands in the northeastern United States. Forest Ecology and Management. 185:65-74.

Chapman, J.A., J.G. Hockman and W.R. Edwards. 1982. Cottontails (Sylvilagus floridanus and Allies). Pp. 83-123 in J.A. Chapman and G.A. Feldhamer, editors. Wild Mammals of North America. The John Hopkins University Press, Baltimore, Maryland, USA.

Chapman, J.A. and G. Ceballos. 1990. Chapter 5: The Cottontails In Rabbits, hares, and pikas -- status survey and conservation action plan. pp. 95-110. Ed. by J.A. Chapman and J.E.C. Flux. International Union of Conservation and Nature, Gland, Switzerland.

Cronon, W. 1983. Changes in the Land. Indians, Colonists and Ecology of New England. McGraw-Hill Ryerson Ltd., Toronto. 241 pp.

Fenderson, L. E., A. I. Kovach, J. A. Litvaitis, K. M. O'Brien, K. M. Boland and W. J. Jakubas. 2014. A multiscale analysis of gene flow for the New England cottontail, an imperiled habitat specialist in a fragmented landscape. Ecology and Evolution 4:1853-1875.

Foster, R.W. and A. Kurta. 1999. Roosting ecology of the northern bat (Myotis septentrionalis) and comparisons with the endangered Indiana bat (Myotis sodalis). Journal of Mammology 80:659-672.

Fuller, S. and A. Tur. 2012. Conservation Strategy for the New England Cottontail (*Sylvilagus transitionalis*). Pp. 148. Available at www.newenglandcottontail.org (accessed March 18, 2015).

Garroway, C.J. and H.G. Broders. 2008. Day roost characteristics of northern longed-eared bats (Myotis septentrionalis) in relation to female reproductive status. Ecoscience 15:89-93.

Johnson, J. B., J.H. Roberts, T.L. King, J.W. Edwards, W.M. Ford and D.A. Ray. 2014. Genetic structuring of northern myotis (*Myotis septentrionalis*) at multiple spatial scales. Acta Theriologica, 59(2), 223-231.

Johnston, J.E. 1972. Identification and distribution of cottontail rabbits in southern New England. MS thesis, University of Connecticut, Storrs. 70 pp.

Lacki, M.J. and J. H. Schwierjohann. 2001. Day-roost characteristics of northern bats in mixed mesophytic forest. Journal of Wildlife Management 65:482-488.

Latham, R.E. 2003. Shrubland longevity and rare plant species in northeastern United States. Forest Ecology and Management. 185:21-39.

Litvaitis, M.K. and J.A. Litvaitis. 1996. Using mitochondrial DNA to inventory the distribution of remnant populations of New England cottontails. Wildl. Soc. Bull. 24:725-730.

Litvaitis, J.A. 2001. Importance of early successional habitats to mammals in eastern forests. Wildlife Society Bulletin. 29:466-473.

Litvaitis, J.A. and W.J. Jakubas. 2004. New England Cottontail (*Sylvilagus transitionalis*) Assessment 2004. 59 pp.

Litvaitis, J.A. and B. Johnson. 2002. Distribution, status, and monitoring of New England cottontails in Maine. Final report to Maine Dept. of Inland Fish. and Wildl., Dept. of Natural Resources, University of New Hampshire, Durham. 69 pp.

Litvaitis, J.A. 2003. Are pre-Columbian conditions relevant baselines for managed forests in the northeast United States? Forest Ecology and Management. 185:113-126.

Litvaitis, J.A., J.P. Tash, M.K. Litvaitis, M.N. Marchand, A.I. Kovach and R. Innes. 2006. A range-wide survey to determine the current distribution of New England cottontails. Wildlife Society Bulletin. 34(4):1190-1197.

Litvaitis, J.A. and R. Villafuerte. 1996. Factors affecting the persistence of New England cottontail metapopulations: the role of habitat management. Wildlife Society Bulletin. 24:686-693.

Lorimer, C.G. and A.S. White. 2003. Scale and frequency of natural disturbances in the northeastern US: implications for early successional forest habitats and regional distributions. Forest Ecology and Management. 185: 41-64.

McWilliams, W. H., B. J. Butler, L. E. Caldwell, D. M. Griffith, M. L. Hoppus, K. M. Laustsen, A. J. Lister, T. W. Lister, J. W. Metzler, R. S. Morin, S. A. Sader, L. B. Stewart, J. R. Steinman, J. A. Westfall, D. A. Williams, A. Whitman and C. W. Woodall. 2005. The forests of Maine: 2003. U.S. Forest Service Northeastern Research Station, Resource Bulletin. NE-164, Newtown Square, Pennsylvania, USA.

Nelson, E.W. 1909. North American Fauna: The rabbits of North America. U.S. Department of Agriculture, Bureau of Biological Survey. No. 29.

Probert, B.P. and J.A. Litvaitis. 1996. Behavioral interactions between invading and endemic lagomorphs: implications for conserving a declining species. Biol. Cons. 76:289-295.

Sasse, D.B. 1995. Summer roosting ecology of cavity-dwelling bats in the White Mountain National Forest. MS thesis, University of New Hampshire, Durham, NH. 65pp.

U.S. Department of the Interior. 1999. U.S. Fish and Wildlife Service and National Marine Fisheries Service. Announcement of Final Policy for Candidate Conservation Agreements with Assurances. Federal Register 64(116):32726-32736.